

What Is Claimed Is:

1. A device for the voltage supply of a heavy power consumer in a motor vehicle, including a generator which provides a controlled d.c. voltage for charging a battery (11) and for supplying a plurality of consumers (12), and a heavy power consumer (14) which is connectable to the battery (11) or the generator (10) via a circuit configuration, wherein the circuit includes a first electronic component which is situated between the positive pole of the battery and the heavy power consumer, and at least two charge storage devices (16, 17) which are connectable to one another via switching means (18, 19), and are connectable to the heavy power consumer (14) and the electronic component (15), and the switching means (18, 19) are operated by a control device (20) in a specifiable manner.
2. The device for the voltage supply as recited in Claim 1, wherein the at least two charge storage devices (16, 17) are connected in series by appropriate switching of the switching means (18, 19) via a control device when the heavy power consumer (14) is activated.
3. The device for the voltage supply as recited in Claim 1 or 2, wherein the at least two charge storage devices (16, 17) are operated in parallel connection by appropriate switching of the switching means (18, 19) via a control device when the heavy power consumer (14) is deactivated or the starting process of the heavy power consumer is completed.
4. The device for the voltage supply as recited in one of the preceding claims, wherein the transition from the series connection to the

- parallel connection of the at least two charge storage devices (16, 17) takes place in at least two steps.
5. The device for the voltage supply as recited in one of the preceding claims,  
wherein the transition from the series connection to the parallel connection of the at least two charge storage devices (16, 17) takes place continuously.
  6. The device for the voltage supply as recited in one of the preceding claims 1,  
wherein the heavy power consumer (14) is an electric auxiliary compressor (EAC), a piezoelectric actuator, or an electric, electrohydraulic brake (EHB), or an electric power steering system (EPS).
  7. The device for the voltage supply as recited in one of the preceding claims,  
wherein the energy storage devices (16, 17) are super capacitors or supercaps or ultracaps.
  8. The device for the voltage supply as recited in one of the preceding claims,  
wherein the electronic component (15) is a high current diode, or an electronically controlled switch, or a linearly regulated switch.
  9. The device for the voltage supply as recited in one of the preceding claims,  
wherein the control device (20) is a control unit, in particular a control unit for the vehicle electrical system, an engine controller, a control unit for an electric auxiliary compressor and which outputs triggering signals for operating the individual switches.
  10. A method for the voltage supply,  
wherein, in a device as recited in one of Claims 1

through 9, the control unit (20) detects when a heavy power consumer is to be connected, the control unit (20) then outputs appropriate triggering signals to the switches (18, 19) and ensures the required voltage supply for the heavy power consumers.